

## PROPOSED REGULATION FOR IN-USE OFF-ROAD DIESEL VEHICLES

Adopt new section ~~2416~~2449, in Title ~~title~~ 13, article 4.8, chapter 9, California Code of Regulations (CCR) to read as follows:

(Note: The entire text of article 4.8, section 2499 is new language.):

### Article 4.8 In-Use Off-Road Diesel-Fueled Fleets

#### Section 2449 Emission Standards for In-Use Off-Road Diesel-Fueled Fleets

##### (a) Purpose

The purpose of this regulation is to reduce diesel particulate matter (PM) and criteria pollutant emissions from in-use off-road diesel-fueled vehicles.

##### (b) Applicability

Except as provided in the paragraph below, the regulation applies to any person, business, or government agency who owns or operates within California any diesel-fueled off-road compression ignition vehicle engine with maximum power of 25 horsepower (hp) or greater that is used to provide motive power in a workover rig or to provide motive power in any other motor vehicle that (1) is not designed to or cannot be registered and driven safely on-road, and (2) is not an implement of husbandry or off-highway vehicle (recreational). This regulation also applies to any person who sells a vehicle with such an engine.

Vehicles with engines subject to this regulation are used in construction, mining, rental, government, landscaping, recycling, landfilling, manufacturing, warehousing, ski industry, composting, airport ground support equipment, industrial, and other operations. The regulation does not cover locomotives, commercial marine vessels, marine engines, recreational vehicles, or combat and tactical support equipment. The regulation also does not cover stationary or portable equipment, or equipment or vehicles used in agricultural operations, or equipment at ports or intermodal railyards. Off-road diesel vehicles owned and operated by an individual for personal, noncommercial purposes are exempt from the provisions of this regulation.

##### (c) Definitions

- (1) **Agricultural operations** means (1) the growing or harvesting of crops (including loggingforest operations) or the raising of fowl or animals for the primary purpose of making a profit, providing a livelihood, or conducting agricultural research or instruction by an educational institution, or (2) agricultural crop preparation services such as packinghouses, cotton gins, nut

hullers and processors, dehydrators, and feed and grain mills. Agricultural crop preparation services include only the first processing after harvest, not subsequent processing, canning, or other similar activities. For forest operations, agricultural crop preparation services include milling, peeling, producing particleboard and medium density fiberboard, and producing woody landscape materials. A vehicle that is used for agricultural operations and for other work is considered to be a vehicle used in agricultural operations only if over half of its annual operating hours are for agricultural operations.

- (2) **Airport ground support equipment (GSE)** is mobile diesel-fueled off-road compression ignition vehicles with maximum power of 25 horsepower or greater used to service and support aircraft operations. GSE vehicles perform a variety of functions, including but not limited to: starting aircraft, aircraft maintenance, aircraft fueling, pushing or towing aircraft, transporting cargo to and from aircraft, loading cargo, and baggage handling, lavatory service, and food service. GSE vehicles include equipment types such as baggage tugs, belt loaders, and cargo loaders.
- (3) **Alternative fuel** means natural gas, propane, ethanol, methanol, gasoline (when used in hybrid electric vehicles only), hydrogen, electricity, fuel cells, or advanced technologies that do not rely on diesel fuel. "Alternative fuel" also means any of these fuels used in combination with each other or in combination with other non-diesel fuels.
- (4) **Best Available Control Technology (BACT)** means the exhaust retrofit and accelerated turnover requirements in section ~~2446~~2449(d)(2).
- (1) **Captive Attainment Area Fleet** means a fleet with all of its vehicles only in the following counties: Alpine, Colusa, Del Norte, Glenn, Humboldt, Lake, Lassen, Mendocino, Modoc, Monterey, Plumas, San Benito, Santa Cruz, Shasta, Sierra, Siskiyou, Trinity, Tehama, and Yuba. Captive attainment area fleet vehicles must not operate outside the counties listed. Fleets that operate vehicles outside the counties listed may not be defined as captive attainment area fleets.
- (1) **Carryover retrofit credit**, as calculated under section 2449(d)(2)(B)2., means a way of tracking retrofits accomplished in excess of those required by the minimum BACT retrofit requirements. Fleets may take credit for such excess retrofits in earlier years in order to do less retrofitting in later years.
- (1) **Carryover turnover credit**, as calculated under section 2449(d)(2)(A)2., means a way of tracking turnover accomplished in excess of the minimum BACT turnover requirements. Fleets may take credit for such excess turnover in earlier years to do less turnover in later years.

~~(8)~~(5) **Combat and Tactical Support Equipment** means equipment that meets military specifications, is owned by the U.S. Department of Defense and/or the U.S. military services or its allies, and is used in combat, combat support, combat service support, tactical or relief operations or training for such operations.

(1) **Dedicated Snow Removal Vehicle** means a vehicle that is operated exclusively to remove snow from public roads or to support snow removal activities. Such vehicles may have permanently affixed snow removal equipment such as a snow blower or auger and may include but are not limited to motor graders, loaders, and snow blowers.

~~(10)~~(6) **Diesel particulate matter (diesel PM)** means the particles found in the exhaust of diesel-fueled CI engines. Diesel PM may agglomerate and adsorb other species to form structures of complex physical and chemical properties. The Air Resources Board (ARB) has identified diesel PM toxic air contaminant.

~~(11)~~(7) **Diesel PM Index** means an indicator of a fleet's overall diesel PM emission rate. The diesel PM Index for a specific fleet is determined by summing the product of the maximum power of each engine times the diesel PM Emission Factor, and dividing by the fleet's total maximum power.

~~(12)~~(8) **Diesel PM Target Rate** means the fleet average that a specific fleet must meet in a compliance year in order to show compliance with the fleet average requirements. The Diesel PM Target Rate varies depending on a fleet's horsepower distribution. The Diesel PM Target Rate for a specific fleet for each compliance year is determined by summing (adding) ~~for each horsepower group~~ the product of the ~~fleet's total~~ maximum power of each engine times (Max Hp) in each horsepower group multiplied by the Diesel PM target, and dividing the resulting sum by the fleet's total maximum power.

~~(13)~~(9) **Emergency operation** means helping alleviate an immediate threat to public health or safety. Examples of emergency operation include repairing or preventing damage to roads, buildings, terrain, and infrastructure as a result of an earthquake, flood, storm, fire, terrorism, or other infrequent act of nature. Routine maintenance or construction to prevent public health risks does not constitute emergency operation.

~~(14)~~(10) **Emission Factor** means diesel PM or oxides of nitrogen (NOx) emission rate in grams per brake-horsepower hour (g/bhp-hr) as shown in Appendix A, unless the engine is a Post-2007 Flexibility Engine (see definition).

(A) Engines certified to Family Emission Limits and flexibility engines certified before January 1, 2007 should still use the emission factors in Appendix A.

- (B) If the model year is unknown, the emission factor is the emission factor shown in Appendix A for 1900-1969 model years.
- (C) For engines that have been retrofit with VDECS, the PM Emission Factor is reduced 50% percent for a Level 2 VDECS, and 85% percent for a Level 3 VDECS; the NOx Emission Factor is reduced by the percentage NOx emission reductions that are verified, if any. The PM Emission Factor is not reduced for a Level 1 VDECS.

~~(15)~~(11) **Equipment Identification Number** means a unique identification number assigned by ARB to each vehicle in an owner's fleet subject to this regulation. All reporting and recordkeeping will link vehicle data with this number.

~~(16)~~(12) **Executive Officer** means the Executive Officer of the ARB or his or her authorized representative.

(1) **Family Emission Limit (FEL)** means an emission level that is declared by the manufacturer to serve in lieu of an emission standard for certification purposes and for the averaging, banking, and trading program, as defined in title 13, California Code of Regulations, section 2423.

~~(18)~~(13) **Fleet** means all off-road vehicles and engines owned by a person, business, or government agency that are operated within California and are subject to the regulation. A fleet includes one or more vehicles. Vehicles that are owned by a rental company and that are leased by the same lessee for a period of one year or more may be excluded from the rental company fleet and included in the fleet of the lessee only if such arrangement is delineated in the lease agreement. If various portions of a fleet are under the control of different responsible officials because they are part of different subsidiaries, divisions, or other organizational structures of a company or agency, the fleet portions may comply separately and be reported separately. However, the total maximum power of the vehicles under common ownership determines whether the fleet must meet the small, medium, or large fleet requirements. A fleet must meet large fleet requirements if the total vehicles under common ownership would be defined as a large fleet. A fleet must meet medium fleet requirements if the total vehicles under common ownership would be defined as a medium fleet. Individual federal or state agencies may report their vehicles separately, but all vehicles owned by agencies of the United States or the State of California agencies must meet the large-medium fleet requirements. Low-use vehicles, dedicated snow-removal vehicles, and vehicles used solely for emergency operations need not be included in the total maximum power used to classify fleets by size. Fleets are classified by size as follows:

- (A) **Large fleet** – ~~Fleet~~ Privately owned fleet with total maximum power (as defined below) greater than 20,000 horsepower (hp). A fleet must meet large fleet requirements if the total vehicles under common ownership would be

defined as a large fleet. ~~All fleets owned by agencies either of the United States or the State of California will be considered as a unit whole and (i.e., an agency in the judicial, legislative, or executive branch of the federal or state government) will be considered as a unit whole and must meet the large fleet requirements.~~

- (B) **Medium Fleet** – Fleet ~~with total maximum power less than or equal to 20,000 hp that is not a small or large fleet.~~ All fleets owned by agencies either of the United States or the State of California (i.e., an agency in the judicial, legislative, or executive branch of the federal or state government) will be considered as a unit whole and must meet the medium fleet requirements set forth in section 2449(d)(1), *infra*.

**Small fleet** – Fleet that ~~is~~ is owned by a small business with total maximum power of less than or equal to 1,500 hp or a local municipality with total maximum power of less than or equal to 1,500 hp, and fleets of low population counties ~~local~~ local municipalities irrespective of total maximum power.

(14)

Forest operations means cutting or removal or both of timber, other solid wood products, including Christmas trees, and biomass from forestlands for commercial purposes, together with all the work incidental thereto, including but not limited to, construction and maintenance of roads, fuel breaks, firebreaks, stream crossings, landings, skid trails, beds for falling trees, fire hazard abatement, and site preparation that involves disturbance of soil or burning of vegetation following forest removal activities. Forest operations include the cutting or removal of trees, tops, limbs and or brush which is processed into lumber and other wood products, and or for landscaping materials, or biomass for electrical power generation. Forest operations do not include conversion of forestlands to other land uses such as residential or commercial developments.

(19)(15) **Highest Level Verified Diesel Emission Control System (VDECS)**

means the highest level VDECS verified by ARB under its *Verification Procedure, Warranty and In-Use Compliance Requirements for In-Use Strategies to Control Emission from Diesel Engines (Verification Procedure)*, title 13, California Code of Regulations (CCR), sections 2700-2710, for a specific engine as of 10 months prior to the compliance date, which (1) can be used without impairing the safe operation of the vehicle as demonstrated per section 2449(e)(7)2449(e)(8), and (2) the diesel emission-control strategy manufacturer ~~and~~ authorized diesel emission-control strategy dealer agrees can be used on a specific engine and vehicle combination without jeopardizing the original engine warranty in effect at the time of application.

Plus designations do not matter; that is, a Level 3 Plus is the same diesel PM level as Level 3; and Level 2 Plus is the same diesel PM level as Level 2.



The highest level VDECS is determined solely based on verified diesel PM reductions. All Level 3 diesel PM devices are higher than all Level 2 diesel PM devices. Level 1 devices are never considered highest level VDECS for the purpose of this regulation.

~~(20)~~(16) **Implement of husbandry** is as defined in California Vehicle Code (VC) Division 16.

- (1) **Local Municipality** means a city, county, city and county, special district, or other public agency, or two or more public entities acting jointly, or the duly constituted body of an Indian reservation or rancheria. Agencies of the United States of America or the State of California, and departments, divisions, public corporations, or public agencies of this State or of the United States are not considered local municipalities.

~~(22)~~(17) **Low-Population County Local or Municipality Fleet** means a fleet owned by a local municipality (as defined above) that is located in a county as defined in title 13, CCR, section 2022(b)(2); ~~a municipality that is headquartered in a low-population county, and identified in section 2022(c)(2), Table 2, or, using the criteria set forth in title 13, CCR, section 2022.1(c)(4), a local municipality not located in a low-population county that has requested and has received Executive Officer approval to be treated like a municipality in a low-population county~~ or a county or municipality that has been issued designation by the Executive Officer as a fleet located in a designated low-population county per the procedures in Title 13, CCR, section 2022.1(c)(4). Fleets owned by such local municipalities ~~are~~ shall be treated as small fleets even if their total maximum power exceeds 1,500 horsepower.

- (1) **Low-use vehicle** means a vehicle that operated in California less than 100 hours during the preceding 12-month period running from March 1 to end of February. For example, when reporting in 2008, the hours of use between March 1, 2007 and February 29, 2008 would be used to determine low-use status. Vehicles that operate both inside and outside of California can meet the low-use vehicle definition if they are used less than 100 hours per year in California. Engine operating hour data must be from a non-resettable hour meter; a vehicle without a properly functioning non-resettable hour meter cannot be defined as a low-use vehicle. Hours used for emergency operations are not counted when determining low-use status. Small fleets need not count hours used during snow removal operations when determining low-use status.

~~(24)~~(18) **Maximum power** means the engine's net horsepower or net flywheel power certified to Society of Automotive Engineers (SAE) Method J1349. ~~means the maximum rated horsepower output of an engine at rated speed as stated by the manufacturer in the manufacturer's sales and service literature. If~~

the engine's net horsepower or net flywheel power certified to SAE Method J1349 is not available, another net horsepower or net flywheel power from the manufacturer's sales and service literature may be used.

(25)(19) **Motor vehicle** has the same meaning as defined in VC Section 415.

(26)(20) **New fleet** means a fleet that is acquired or that enters California after March 1, 2008. Such fleets may include new businesses or out-of-state businesses that bring vehicles into California for the first time after March 1, 2008.

(27)(21) **NOx index** means an indicator of a fleet's overall NOx emission rate. The NOx Index for a specific fleet is determined by summing the product of the maximum power of each engine times the NOx Emission Factor, and dividing by the fleet's total maximum power.

(28)(22) **NOx target rate** means the NOx fleet average that a specific fleet must meet in a compliance year in order to show compliance with the fleet average requirements. The NOx Target Rate varies depending on a fleet's horsepower distribution. The NOx Target Rate for a specific fleet for each compliance year is determined by summing (adding) for each horsepower group the product of the fleet's total maximum power (Max Hp) in each horsepower group of each engine times multiplied by the NOx target, and dividing the resulting sum by the fleet's total maximum power.

(29)(23) **Off-highway vehicle** is defined in VC Division 16.5.

(30)(24) **Oxides of nitrogen (NOx)** means compounds of nitric oxide, nitrogen dioxide, and other oxides of nitrogen. Nitrogen oxides are typically created during combustion processes and are major contributors to smog formation and acid deposition.

(31)(25) **Post-2007 Flexibility Engine** means an engine certified on or after January 1, 2007 to the implementation flexibility standards in title 13, CCR, section 2423(d). Such flexibility engines are generally labeled as follows by the engine manufacturer:

"THIS ENGINE COMPLIES WITH CALIFORNIA EMISSION REQUIREMENTS UNDER 13 CCR 2423(d)..." or

"THIS ENGINE CONFORMS TO CALIFORNIA OFF-ROAD COMPRESSION-IGNITION ENGINE REGULATIONS UNDER 13 CCR 2423(d)."

Post-2007 flexibility engines should use the emission standard to which the engine is certified. For example, a Tier 4 engine flexed back to Tier 2 emission

levels should use the Tier 2 PM standard as the emission factor (converted from grams per kilowatt hour (g/kW-hr) to g/bhp-hr by multiplying by 0.746).

(32)(26) **Queuing** means the intermittent starting and stopping of a vehicle while the driver, in the normal course of doing business, is waiting to perform work or a service, and when shutting the vehicle engine off would impede the progress of the queue and is not practicable. Queuing does not include the time a driver may wait motionless in line in anticipation of the start of a workday or opening of a location where work or a service will be performed.

(33)(27) **Registered and driven safely on-road** means a vehicle meets the requirements to be registered for on-road operation in VC Division 3, Chap. 1, Article 1, Sec. 4000 et seq. (i.e., required to be registered or could be registered), and the requirements to be driven safely on-road in "Equipment of Vehicles" requirements in VC Division 12, Chap. 1, Sections 24000 et seq. and "Size, Weight, and Load" requirements in VC Division 15, Sections 35000 et seq. Having a California Special Construction Equipment plate as defined in California Vehicle Code Section 565 and 570 does not constitute registration.

(34)(28) **Repower** means to replace the engine in a vehicle with another engine meeting a subsequent engine emissions standard (e.g., replacing a Tier 0 engine with a Tier ~~4~~2 or later engine).

(35)(29) **Responsible Official** means one of the following:

- (A) For a corporation: A president, secretary, treasurer, or vice president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation,
- (B) For a partnership or sole proprietorship: a general partner or the proprietor, respectively
- (C) For a municipality, state, federal, or other public agency: either a principal executive officer or ranking elected official. For the purposes of this part, a principal executive officer of a federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of the U.S. EPA).

(36)(30) **Retire** means to take an engine out of service and not operate it again in the State of California. To retire an engine, the vehicle with the engine may be moved outside of California, sold, or scrapped.

(37)(31) **Small business** is as defined in Government Code section 11342.610.

(1) **Snow removal operations means removing snow from public roads.**

(39)(32) **Specialty vehicle** means a vehicle for which no used vehicle with a cleaner engine that can serve an equivalent function and perform equivalent work is available.



~~(40)~~(33) **Sum** means the aggregate of two or more numbers as determined by the mathematical process of addition.

~~(41)~~(34) **Tier 0 Engine** means an engine not subject to the requirements in title 13, CCR, section 2423; Title 40, Code of Federal Regulations (CFR), Part 89; or Title 40, CFR, Part 1039.

~~(42)~~(35) **Tier 1 Engine** means an engine subject to the Tier 1 new engine emission standards in title 13, CCR, Section 2423(b)(1)(A) and/or Title 40, CFR, Part 89.112(a). This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 1 Family Emission Limits (FEL) listed in Title 13, CCR, 2423(b)(2)(A) and/or Title 40, CFR, Part 89.112(d).

~~(43)~~(36) **Tier 2 Engine** means an engine subject to the Tier 2 new engine emission standards in title 13, CCR, Section 2423(b)(1)(A) and/or Title 40, CFR, Part 89.112(a). This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 2 FEL listed in Title 13, CCR, 2423(b)(2)(A) and/or Title 40, CFR, Part 89.112(d).

~~(44)~~(37) **Tier 3 Engine** means an engine subject to the Tier 3 new engine emission standards in title 13, CCR, Section 2423(b)(1)(A) and/or Title 40, CFR, Part 89.112(a). This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 3 FEL listed in Title 13, CCR, 2423(b)(2)(A) and/or Title 40, CFR, Part 89.112(d).

~~(45)~~(38) **Tier 4 Final Engine** means an engine subject to the final after-treatment-based Tier 4 emission standards in title 13, CCR, Section 2423(b)(1)(B) and/or Title 40, CFR, Part 1039.101. This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 4 FEL listed in Title 13, CCR, 2423(b)(2)(B) and/or Title 40, CFR, Part 1039.101.

~~(46)~~(39) **Tier 4 Interim Engine** means an engine subject to the interim Tier 4 emission standards (also known as transitional) in title 13, CCR, Section 2423(b)(1)(B) and/or Title 40, CFR, Part 1039.101. This also includes engines certified under the averaging, banking, and trading program with respect to the Tier 4 FEL listed in Title 13, CCR, 2423(b)(2)(B) and/or Title 40, CFR, Part 1039.101.

~~(47)~~(40) **Total maximum power** means the sum of maximum power for all of a fleet's engines that are subject to this regulation. Low-use vehicles, -dedicated snow-removal vehicles, and vehicles used solely for emergency operations need not be included in the sum.

~~(48)~~(41) **Verified Diesel Emission Control System (VDECS)** means an emissions control strategy, designed primarily for the reduction of diesel PM emissions, which has been verified pursuant to the *Verification Procedures*.

VDECS can be verified to achieve Level 1 diesel PM reductions (25% percent), Level 2 diesel PM reductions (50% percent), or Level 3 diesel PM reductions (85% percent). VDECS may also be verified to achieve NOx reductions. See also definition of Highest Level VDECS.

**VDECS Failure** means the condition of not achieving the emissions reductions to which the VDECS is verified. Such condition could be due to inappropriate installation, damage, or deterioration during use. If a Level 3 VDECS is emitting visible smoke, it should be assumed to have failed.

(49)(42) **Workover rig** means a mobile self-propelled rig used to perform one or more remedial operations, such as deepening, plugging back, pulling and resetting liners, on a producing oil or gas well to try to restore or increase the well's production.

#### (d) Performance Requirements –

##### (1) **Fleet Average Requirements –**

Each fleet must meet the fleet average requirements below by March 1 of each year or demonstrate that it applied the best available control technology (BACT) as described in section 24162449(d)(2). There are differing requirements for large, medium, and small fleets. Fleets owned by low-population county local ~~ies or~~ municipalities are subject to the small fleet requirements, even if their total maximum power exceeds 1,500 horsepower. Captive attainment area fleets are not subject to the NOx fleet average requirements. Section 24162449(d)(4) describes requirements for fleets that change size.

##### (A) Fleet Average Requirements for Large and Medium Fleets

1. **NOx Fleet Average** - For each compliance date, a large or medium fleet that is not a captive attainment area fleet must demonstrate that its overall fleet average NOx Index was less than or equal to the calculated NOx Target Rate.

The equation for calculating NOx Target Rate is below:

NOx Target Rate = [SUM of ((Target x Max Hp for each engine in fleet x Target) for all engines in fleet) for all engines in fleet] ÷ [SUM of (Max Hp) for all engines in fleet]

where Target is the NOx target in g/bhp-hr from Table 1. To find the Target for each engine, read the value for the appropriate row based on the compliance year and the appropriate column based on the engine's maximum horsepower from Table 1. [Target<sub>25-49</sub> x (SUM of Max Hp for all engines with 25-49 max hp) + Target<sub>50-74</sub> x (SUM of Max Hp for all engines with 50-74 max hp) + Target<sub>75-99</sub> x (SUM of Max Hp

~~for all engines with 75-99 max hp) + Target<sub>100-174</sub> x (SUM of Max Hp for all engines with 100-174 max hp) + Target<sub>175-299</sub> x (SUM of Max Hp for all engines with 175-299 max hp) + Target<sub>300-599</sub> x (SUM of Max Hp for all engines with 300-599 max hp) + Target<sub>600-750</sub> x (SUM of Max Hp for all engines with 600-750 max hp) + Target<sub>>750</sub> x (SUM of Max Hp for all engines with >750 max hp)] ÷ [SUM of (Max Hp) for all engines in fleet]~~

~~where Target<sub>25-49</sub>, Target<sub>50-74</sub>, Target<sub>75-99</sub>, Target<sub>100-174</sub>, Target<sub>175-299</sub>, Target<sub>300-599</sub>, Target<sub>600-750</sub> and Target<sub>>750</sub> are in Table 1.~~

The equation for calculating NOx Index is below:

NOx Index = [SUM of (Max Hp for each engine in fleet x NOx Emission Factor for each engine in fleet) for all engines in fleet ~~for each engine in fleet~~] ÷ [SUM of (Max Hp) for all engines in fleet]

Table 1 shows the targets used to calculate the NOx Target Rate for each compliance date for large and medium fleets. The Emission Factors are defined in Appendix A.

**Table 1 – Large and Medium Fleet NOx Targets  
For Use in Calculating Fleet Target Rates [g/bhp-hr]**

Compliance Date: March 1 of Year	NOx Targets for each Max Hp Group							
	25-49 hp	50-74 hp	75-99 hp	100-174 hp	175-299 hp	300-599 hp	600-750 hp	>750 hp
<b>2009 (large fleets only)</b>	5.9	6.7	7.2	6.4	6.2	5.9	6.1	7.1
<b>2010</b>	5.8	5.6	6.1	5.5	5.3	5.0	5.2	6.1
<b>2011</b>	5.8	5.6	6.1	5.5	5.3	5.0	5.2	6.1
<b>2012</b>	5.6	5.0	5.4	4.9	4.6	4.4	4.5	5.5
<b>2013</b>	5.6	5.0	5.4	4.9	4.6	4.4	4.5	5.5
<b>2014</b>	5.1	4.5	4.8	4.4	4.0	3.8	3.9	5.0
<b>2015</b>	5.1	4.5	4.8	4.4	4.0	3.8	3.9	5.0
<b>2016</b>	4.7	4.1	4.1	3.7	3.3	3.2	3.3	4.5
<b>2017</b>	4.7	4.1	4.1	3.7	3.3	3.2	3.3	4.5
<b>2018</b>	4.4	3.7	3.5	3.1	2.8	2.7	2.8	4.0
<b>2019</b>	4.4	3.7	3.5	3.1	2.8	2.7	2.8	4.0
<b>2020</b>	4.1	3.4	2.9	2.6	2.3	2.3	2.3	3.7

2. **Diesel PM Fleet Average** - For each compliance date, a large or medium fleet must demonstrate that its overall fleet average Diesel PM Index was less than or equal to the calculated Diesel PM Target Rate.

The equation for calculating Diesel PM Target Rate is below:

Diesel PM  
Target Rate

$$= \frac{[\text{SUM of } (\text{Target} \times \text{Max Hp for each engine in fleet} \times \text{Target for each engine in fleet}) \text{ for all engines in fleet}]}{[\text{SUM of } (\text{Max Hp}) \text{ for all engines in fleet}]}$$

where Target is the Diesel PM target in g/bhp-hr from Table 2. To find the Target for each engine, read the value for the appropriate row based on the compliance year and the appropriate column based on the engine's maximum horsepower from Table 2. ~~Target<sub>25-49</sub> × (SUM of Max Hp for all engines with 25-49 max hp) + Target<sub>50-74</sub> × (SUM of Max Hp for all engines with 50-74 max hp) + Target<sub>75-99</sub> × (SUM of Max Hp for all engines with 75-99 max hp) + Target<sub>100-174</sub> × (SUM of Max Hp for all engines with 100-174 max hp) + Target<sub>175-299</sub> × (SUM of Max Hp for all engines with 175-299 max hp) + Target<sub>300-599</sub> × (SUM of Max Hp for all engines with 300-599 max hp) + Target<sub>600-750</sub> × (SUM of Max Hp for all engines with 600-750 max hp) + Target<sub>>750</sub> × (SUM of Max Hp for all engines with >750 max hp)) ÷ [SUM of (Max Hp) for all engines in fleet]~~  
~~where Target<sub>25-49</sub>, Target<sub>50-74</sub>, Target<sub>75-99</sub>, Target<sub>100-174</sub>, Target<sub>175-299</sub>, Target<sub>300-599</sub>, Target<sub>600-750</sub> and Target<sub>>750</sub> are in Table 2.~~

The equation for calculating Diesel PM Index is below:

$$\text{Diesel PM Index} = \frac{[\text{SUM of } (\text{Max Hp for each engine in fleet} \times \text{PM Emission Factor for each engine in fleet}) \text{ for each-all engines in fleet}]}{[\text{SUM of } (\text{Max Hp}) \text{ for all engines in fleet}]}$$

Table 2 shows the targets used to calculate the Diesel PM Target Rate for each compliance date for large and medium fleets. The Emission Factors are defined in Appendix A.

**Table 2 – Large and Medium Fleet PM Targets  
For Use in Calculating Fleet Target Rates [g/bhp-hr]**

PM Targets for each Max Hp Group	
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Compliance Date: March 1 of Year	25-49 hp	50- 74 hp	75- 99 hp	100- 174 hp	175- 299 hp	300- 599 hp	600- 750 hp	>750 hp
2009 (large fleets only)	0.50	0.69	0.70	0.37	0.25	0.20	0.23	0.34
2010	0.46	0.60	0.62	0.33	0.23	0.18	0.20	0.30
2011	0.46	0.60	0.62	0.33	0.23	0.18	0.20	0.30
2012	0.39	0.43	0.46	0.26	0.16	0.14	0.14	0.24
2013	0.39	0.43	0.46	0.26	0.16	0.14	0.14	0.24
2014	0.29	0.23	0.24	0.18	0.11	0.11	0.11	0.18
2015	0.29	0.23	0.24	0.18	0.11	0.11	0.11	0.18
2016	0.21	0.18	0.19	0.14	0.08	0.08	0.08	0.11
2017	0.21	0.18	0.19	0.14	0.08	0.08	0.08	0.11
2018	0.12	0.12	0.13	0.10	0.06	0.06	0.06	0.08
2019	0.12	0.12	0.13	0.10	0.06	0.06	0.06	0.08
2020	0.08	0.08	0.07	0.06	0.03	0.03	0.03	0.06

#### (B) Fleet Average Requirements for Small Fleets

Small fleets must meet a PM fleet average beginning in ~~2012~~2015. Small fleets are not required to meet a NOx fleet average. To meet the PM fleet average, for each compliance date, a small fleet must demonstrate that its overall fleet average Diesel PM Index was less than or equal to the calculated Diesel PM Target Rate.

The equations for calculating Target Rates and Diesel PM Index are below:

#### Diesel PM

Target Rate =  $\frac{[\text{SUM of } ((\text{Max Hp for each engine in fleet} \times \text{Target} \times \text{Max Hp}) \text{ for all engines in fleet})]}{[\text{SUM of (Max Hp) for all engines in fleet}]}$

where Target is the PM target in g/bhp-hr from Table 3. To find the Target for each engine, read the value for the appropriate row based on the compliance year and the appropriate column based on the engine's maximum horsepower from Table 3.  $\text{Target}_{25-49} \times (\text{SUM of Max Hp for all engines with 25-49 max hp}) + \text{Target}_{50-74} \times (\text{SUM of Max Hp for all engines with 50-74 max hp}) + \text{Target}_{75-99} \times (\text{SUM of Max Hp for all engines with 75-99 max hp}) + \text{Target}_{100-174} \times (\text{SUM of Max Hp for all engines with 100-174 max hp}) + \text{Target}_{175-299} \times (\text{SUM of Max Hp for all engines with 175-299 max hp}) + \text{Target}_{300-599} \times (\text{SUM of Max Hp for all engines with 300-599 max hp}) + \text{Target}_{600-750} \times (\text{SUM of Max Hp for all engines with 600-750 max hp}) + \text{Target}_{>750} \times (\text{SUM of Max Hp for all engines with } >750 \text{ max hp})$



~~of Max Hp for all engines with >750 max hp)] ÷ [SUM of (Max Hp) for all engines in fleet]~~

~~where Target<sub>25-49</sub>, Target<sub>50-74</sub>, Target<sub>75-99</sub>, Target<sub>100-174</sub>, Target<sub>175-299</sub>, Target<sub>300-599</sub>, Target<sub>600-750</sub> and Target<sub>>750</sub> are in Table 3.~~

Diesel PM Index = [SUM of (Max Hp x PM Emission Factor) for each engine in fleet] ÷ [SUM of (Max Hp) for all engines in fleet]

Table 3 shows the targets used to calculate the Diesel PM Target Rate for each compliance date for small fleets. The Emission Factors are defined in Appendix A.

**Table 3 – Small Fleet PM Targets  
For Use in Calculating Fleet Target Rates [g/bhp-hr]**

	PM Targets for each Max Hp Group							
Compliance Date: March 1 of Year	25-49 hp	50-74 hp	75-99 hp	100-174 hp	175-299 hp	300-599 hp	600-750 hp	>750 hp
<b>2012</b>	0.95	0.98	0.98	0.54	0.54	0.49	0.49	0.49
<b>2013</b>	0.95	0.98	0.98	0.54	0.54	0.49	0.49	0.49
<b>2014</b>	0.95	0.98	0.98	0.54	0.54	0.49	0.49	0.49
<b>2015</b>	0.46	0.60	0.62	0.33	0.23	0.18	0.20	0.30
<b>2016</b>	0.46	0.60	0.62	0.33	0.23	0.18	0.20	0.30
<b>2017</b>	0.39	0.43	0.46	0.26	0.16	0.14	0.14	0.24
<b>2018</b>	0.39	0.43	0.46	0.26	0.16	0.14	0.14	0.24
<b>2019</b>	0.29	0.23	0.24	0.18	0.11	0.11	0.11	0.18
<b>2020</b>	0.29	0.23	0.24	0.18	0.11	0.11	0.11	0.18
<b>2021</b>	0.21	0.18	0.19	0.14	0.08	0.08	0.08	0.11
<b>2022</b>	0.21	0.18	0.19	0.14	0.08	0.08	0.08	0.11
<b>2023</b>	0.12	0.12	0.13	0.10	0.06	0.06	0.06	0.08
<b>2024</b>	0.12	0.12	0.13	0.10	0.06	0.06	0.06	0.08
<b>2025</b>	0.08	0.08	0.07	0.06	0.03	0.03	0.03	0.06

(C) **Adding Vehicles to Fleet Between the First and Final Compliance Dates Before Final Compliance Date** – After the first fleet average compliance date and before the final compliance date shown for a fleet, if a fleet that ~~meets~~met the fleet average requirements in ~~24162449~~(d)(1) on ~~a~~the previous compliance date, when it adds a vehicle to its fleet, before the final compliance date shown (i.e., before March 1, 2020 for large or medium fleets or March 1, 2025 for small fleets), within three months of adding the vehicle, the fleet must demonstrate that the fleet still meets the fleet average requirements within three months of adding the vehicle. That is, fleets may not add vehicles that cause them to exceed the most recent fleet average target rate. The added vehicle also must be included in the fleet average

demonstration on the next compliance date. This requirement applies between March 1, 2009 and March 1, 2020 for large fleets, between March 1, 2010 and March 1, 2020 for medium fleets, and between March 1, 2015 and March 1, 2025 for small fleets. Requirements related to adding vehicles for fleets that do not meet the fleet average requirements are in section ~~24162449~~(d)(2)(C). Requirements related to adding vehicles after the final compliance dates are in section 2449(d)(1)(D)1.

**(D) Compliance After the Final Compliance Date –**

1. Commencing respectively on March 1, 2020 for large and medium fleets, and March 1, 2025 for small fleets, no fleet owner may add a vehicle to his fleet, unless the vehicle is equipped with an engine meeting the Tier 3, Tier 4 interim, or Tier 4 final engine emission standards, and the engine is equipped with a diesel particulate filter or the highest level VDECS within 3 months of acquisition.
2. Commencing respectively on March 1, 2020, ~~for large and medium fleets, and March 1, 2025 for small fleets,~~ if a large or medium fleet does not meet ~~the the NOx~~ fleet average target rate for the final compliance date in section ~~24162449~~(d)(1), the fleet must continue to meet the BACT turnover requirements in Section ~~24162449~~(d)(2)(A) and report annually each year until it does so.
1. Except as provided below, commencing respectively on March 1, 2021 for large and medium fleets, and March 1, 2026 for small fleets, all vehicles in each fleet must be equipped with the highest level VDECS. The following engines and vehicles are exempt from this requirement:
  - a. Low-use vehicles.
  - a. Engines for which there is no highest level VDECS (i.e., for which there is no Level 2 or 3 VDECS, or for which there is a Level 2 or 3 VDECS, but it cannot be used without impairing the safe operation of the vehicle as demonstrated per section 2449(e)(8)).
  - a. Engines equipped with a diesel particulate filter and Tier 4 final engines.
  - a. Engines already retrofit with a Level 2 or 3 VDECS that was the highest level VDECS available at time of installation, and
  - a. Vehicles in large and medium fleets that have not yet met the NOx fleet average target rate for the final compliance date in section 2449(d)(1).

**(E) Electric and Alternative Fuel Vehicles and Systems Used to Replace Diesel Vehicles** - Fleets with electric or alternative fuel vehicles may include such vehicles in their fleet average under the following conditions:

1. **Electric and Alternative Fuel Vehicles on or after January 1, 2007**

- a. Fleets may apply to the Executive Officer to include an electric and alternative fuel vehicle purchased on or after January 1, 2007, with a maximum rated power 25 horsepower or greater in their fleet average if all of the following conditions are met:
  - i. The owner can demonstrate it serves a function and performs the work equivalent to that of diesel vehicles and is used for a purpose for which diesel vehicles are predominantly used,
  - ii. The electric or alternative fuel vehicle is used predominantly outdoors,
  - iii. The electric or alternative fuel vehicle is not already included in the fleet average emission level requirements for large spark ignition engine fleets in title 13, Section 2775.1; and
  - iv. If the vehicle is an alternative fuel vehicle, the owner can demonstrate it is certified to a NOx standard less than or equal to the Tier 1 NOx standard for the same horsepower in title 13, CCR, Section 2423(b)(1)(A) and less than or equal to the NOx emissions of a diesel engine of the same model year and horsepower.
- b. For the purposes of compliance with sections ~~24162449~~(d)(1)(BA) and (d)(1)(CB), electric vehicles shall be credited as follows:
  - i. **Double Credit for Electric in 2009-2016** - For compliance dates in 2009 through 2016, the maximum rated power of all electric vehicles may be doubled in determining the *Max Hp* that is used in calculating the Target Rate, Diesel PM Index, and as appropriate, NOx Index. An *Emission Factor* of 0 may be used.
  - ii. **Single Credit for Electric in 2017 and Later** - For compliance dates in year 2017 and later, the maximum rated power of all electric vehicles is used in determining the *Max Hp* that is used in calculating the Target Rate, Diesel PM Index, and, as appropriate, NOx Index. An *Emission Factor* of 0 may be used.
- c. For the purposes of compliance with sections ~~24162449~~(d)(1)(BA) and (d)(1)(CB), each alternative fuel vehicle should use an Emission Factor equal to the emission standard to which its engine is certified in g/bhp-hr. If the alternative fuel vehicle is not certified to a NOx or diesel PM emission standard, the owner may provide an appropriate emission factor, as demonstrated to the Executive Officer.

2. **Stationary or Portable System Used to Replace Mobile Diesel Vehicle**

Fleet owners may apply to the Executive Officer to include portable or stationary systems that replace mobile diesel vehicles, such as a conveyor system used to replace diesel haul trucks at a mine, in the fleet average. The system may be considered in the fleet average by including the maximum horsepower of the diesel vehicles replaced in the calculations of Target Rate, Diesel PM Index, and NOx Index above, along with an

*Emission Factor* of 0. In order to count such a system, all the following conditions must be met:

- a. The owner can demonstrate that it replaced an off-road diesel fueled vehicle subject to this regulation in 2007 or later, and
- b. The system is not already counted toward the fleet average emission level requirements for large spark ignition engine fleets in title 13, CCR section 2775.1 or for portable diesel engine fleets in title 17, CCR section 93116.3.

**3. Electric and Alternative Fuel Vehicle Purchased Prior to January 1, 2007**

- a. Electric airport GSE vehicles purchased prior to January 1, 2007, may be partially counted in the fleet average as follows:
  - i. Include such vehicle's maximum rated power times 0.2 as the *Max Hp* in the calculating the Target Rate, Diesel PM Index, and, as appropriate, NOx Index in section ~~24162449~~(d)(1)(A) and (d)(1)(B), along with an *Emission Factor* of 0.
- b. Fleet owners may apply to the Executive Officer to count a non-GSE electric or alternative fuel vehicle purchased prior to January 1, 2007 in the fleet average if all of the following conditions are met:
  - i. The owner can demonstrate it serves a function and performs the work equivalent to that of diesel vehicles and is used for a purpose for which diesel vehicles are predominantly used,
  - ii. the electric or alternative fuel vehicle is used predominantly outdoors,
  - iii. the vehicle is not already counted toward the fleet average emission level requirements for large spark ignition engine fleets in Title 13, CCR section 2775.1; and
  - iv. if the vehicle is alternative fuel vehicle, certified NOx emission levels are lower than the NOx standard for the same model year and horsepower in Title 13, CCR, Section 2423(b)(1) and Title 40, CFR, Part 89.112(a) and Title 40, CFR, Part 1039.101.

- (2) **BACT Requirements** – Each year, each fleet must determine if it will be able to meet the fleet averages for the next March 1 compliance date, and if not, the following BACT requirement must be met. If a fleet does not meet the NOx Fleet Average in ~~24162449~~(d)(1), it must meet the BACT turnover requirements in ~~24162449~~(d)(2)(A) below. If a fleet does not meet the Diesel PM Fleet Average in ~~24162449~~(d)(1), it must meet the BACT Retrofit Requirements in ~~24162449~~(d)(2)(B). Fleets that fail to meet both the NOx and Diesel PM Fleet Averages in 2449(d)(1) in a compliance year must first meet the BACT turnover requirements in 2449(d)(2)(A) below in that year and then meet the BACT Retrofit Requirements in 2449(d)(2)(B) in that year.

(A) **Turnover Requirements for Fleets Not Meeting NOx Fleet Average** – A fleet may meet the turnover requirements by retiring a vehicle, selling a vehicle, designating a vehicle as a low-use vehicle, or repowering a vehicle, ~~or replacing a vehicle~~. If repowering ~~or replacing~~ a vehicle, the new engine must be Tier 2 or a higher tier and must be a higher tier than the engine replaced. If replacing a vehicle, the new vehicle must meet the Adding Vehicles requirements in 2449(d)(1)(C) and 2449(d)(2)(C).

1. **Turnover Rate** - If a fleet does not meet the NOx Fleet Average in ~~2446~~2449(d)(1), ~~it must demonstrate one of the following~~ on the compliance date that it turned over 10% percent of its total maximum power that existed on March 1 of the previous year since March 1 of the previous year. Any carryover turnover credit previously accrued may be applied toward the 10 percent turnover required in a later year.

1. **Carryover turnover credit** –

a. **Beginning** - All fleets begin with zero carryover turnover credit on March 1, 2008, and may begin accumulating carryover turnover credit on March 1, 2009.

a. **Accumulating carryover turnover credit** – A fleet accumulates carryover turnover credit each year it turns over more than 10 percent of its maximum power. The amount accumulated is the percent of maximum power turned over in excess of 10 percent in the past 12 months prior to March 1.

e.a. **Using carryover turnover credit** - Accumulated carryover turnover credit may be applied to meeting the turnover requirements of section 2449(d)(2)(A)1. in a later year. The amount of carryover turnover credit used to meet the turnover requirements in any one year is subtracted from the carryover turnover credit total available in subsequent years. The amount of actual turnover plus the amount of carryover turnover credit used must equal the minimum BACT turnover rate required by 2449(d)(2)(A)1. ~~or~~

~~b. It turned over 10% of its total maximum power on average annually since March 1, 2008 for large fleets or March 1, 2009 for medium fleets.~~

~~3.2.~~ **Order of turnover** – ~~All e-engines in a fleet~~ that were not subject to a PM standard for new engines (Tier 0 and Tier 1 with no PM standard, i.e., Tier 1 engines between 50 and 174 horsepower) must be turned over ~~first~~, before turnover of any other higher tier engines may be counted toward the turnover requirements in 2449(d)(2)(A) or toward accumulating carryover turnover credit.

~~4.3.~~ **Exemptions** – Vehicles meeting the criteria below are exempt from the turnover requirement. A fleet is exempt from the turnover requirement in 2449(d)(2)(A)1. if all its vehicles meet one of the criteria below:;

a. Vehicles less than 10 years old – If all vehicles in a fleet will be less than 10 years old on the compliance date, no turnover is required.



- b. Specialty vehicles if all the following criteria are met:
  - i. The fleet has turned over all other vehicles first,
  - ii. No repower is available for the specialty vehicle, as demonstrated to the Executive Officer,
  - iii. A used vehicle with a cleaner engine is not available to serve a function and perform the work equivalent to that of the specialty vehicle, as demonstrated to the Executive Officer, and
  - iv. The specialty vehicle has been retrofit with highest level VDECS.
- c. A vehicle retrofit within the last six years with a Level 2 or 3 VDECS that was highest level VDECS at the time of retrofit.
- d. A vehicle with a Tier 4 interim engine or Tier 4 final engine.
- 1. Delay Tier 1 turnover - Provided that all Tier 0 vehicles in the owner's fleet not subject to the exemptions in 2449(d)(2)(A)4. have been turned over, all vehicles with a Tier 1 or higher engine are exempt from the turnover requirement until March 1, 2013.
- 1. Designating vehicle as low-use – A fleet may designate a vehicle that was formerly used 100 hours or more per year as low-use by limiting its use to less than 100 hours per year and committing to keep its use less than 100 hours per year.
  - a. Only vehicles formerly used 100 hours or more per year may be so designated. Vehicles so designated may be counted toward the turnover requirements.
  - a. Once designated as low-use, a vehicle may never again be used more than 100 hours per year by the fleet unless the vehicle meets the Adding Vehicles requirements in 2449(d)(2)(C).
  - a. A fleet is not obliged to designate a vehicle whose use drops below 100 hours per year as low-use, nor to count it toward the turnover requirements. If such a vehicle is not designated as low-use, its use may increase beyond 100 hours per year in subsequent years.
- 7.4. Rounding - If the horsepower required to be turned over under section 2449(d)(2)(A) is less than half of the maximum power of the lowest horsepower engine in the fleet that is subject to the turnover requirements, the next engine is not required to be turned over. However, on the next year's compliance date, any horsepower not turned over due to this rounding provision must be added to the required turnover under section 2449(d)(2)(A). Once the required horsepower to be turned over equals or exceeds half of the maximum power of the next engine in the fleet that is subject to the turnover requirements, the next engine must be turned over.

**(B) Retrofit Requirements for Fleets Not Meeting Diesel PM Fleet Average –**

- 4. **Retrofit Rate** - If a fleet does not meet the Diesel PM Fleet Average in ~~2416~~2449(d)(1), it must demonstrate that it ~~did one of the following~~:

a. Retrofit 20 percent of its total maximum power (not including specialty vehicles retrofitted and exempted from turnover in section ~~24162449~~(d)(2)(A)34.b.) with highest level VDECS since March 1 of the previous year. Any carryover retrofit credit previously accrued may be applied toward the 20 percent retrofit required, or

1.2. On average, annually retrofit 20 percent of its total maximum power (not including specialty vehicles retrofitted and exempted from turnover in section ~~24162449~~(d)(2)(A)3.b.) with highest level VDECS since March 1, 2008 for large fleets, March 1, 2009 for medium fleets, or March 1, 2014 for small fleets.

1. **Carryover retrofit credit –**

a. **Beginning** - All fleets begin with zero carryover retrofit credit on March 1, 2008, and may begin accumulating carryover retrofit credit on March 1, 2009.

a. **Accumulating carryover retrofit credit** – A fleet accumulates carryover retrofit credit each year it retrofits more than 20 percent of its maximum power. The amount accumulated is the percent of maximum power retrofit in excess of 20 percent in the past 12 months prior to March 1.

a. **Using carryover retrofit credit** - Accumulated carryover retrofit credit may be applied to meeting the retrofit requirements of section 2449(d)(2)(B)1. in a later year. The amount of carryover retrofit credit used to meet the retrofit requirements in any one year is subtracted from the carryover retrofit credit total available in subsequent years. The amount of actual retrofit plus the amount of carryover retrofit credit used must equal the minimum BACT retrofit rate required by 2449(d)(2)(B)(1).

3. **Order of Retrofit** – No Level 2 VDECS may be installed-counted toward the retrofit requirements in 2449(d)(2)(B) until all engines in vehicles older than 5 years for which the highest level VDECS available is a Level 3 VDECS have been retrofit, except for specialty vehicles utilizing the exemption in Section ~~24162449~~(d)(2)(A)34.b. for which Level 2 is the highest level VDECS.

4. **Exemptions** – The following exemptions from the retrofit requirement apply, provided that retrofits have been or are being applied to all other engines in the owner's fleet not subject to these exemptions. A fleet is exempt from the retrofit requirement in 2449(d)(2)(B)1. if all its vehicles' engines meet one of the criteria below:

a. Engines in vehicles less than 5 years old,

b. Engines for which there is no highest level VDECS (i.e., for which there is no Level 2 or 3 VDECS, or for which there is a Level 2 or 3 VDECS, but it cannot be used without impairing the safe operation of the vehicle),

c. Engines equipped with a diesel particulate filter and Tier 4 final engines, or

- d. Engines already retrofit with a Level 2 or 3 VDECS that was the highest level VDECS available at time of installation. An engine with a Level 2 VDECS that was not the highest level VDECS at time of installation does not qualify for this exemption.
1. **Rounding** - If the horsepower required to be retrofit under section 2449(d)(2)(B) is less than half of the maximum power of the lowest horsepower engine in the fleet that is subject to the retrofit requirements, the next engine is not required to be retrofitted. However, on the next year's compliance date, any horsepower not retrofit due to this rounding provision must be added to the required retrofit under section 2449(d)(2)(B). Once the required horsepower to be retrofit equals or exceeds half of the maximum power of the next engine in the fleet that is subject to the retrofit requirements, the next engine must be retrofitted.
- (C) **Adding vehicles** – A fleet meeting the BACT requirements in lieu of the fleet average requirements may not add a vehicle to its fleet that would further increase its emissions above the fleet average target rate, as described below.
1. **Large and Medium Fleets** - A large or medium fleet meeting that met the BACT requirements in section 24162449(d)(2) instead of the fleet average requirements in section 24162449(d)(1) on the most recent compliance date may not add a vehicle to its fleet unless both all of the following conditions are met:
- a. The vehicle engine is Tier 2 or higher.
- b.a. The vehicle engine's PM Emission Factor (after being adjusted for any VDECS) is less than or equal to the fleet's Diesel-PM target in Table 1 for the appropriate maximum power and the next compliance date, Index for the most recent compliance date, and
- e.b. The vehicle engine's NOx Emission Factor (after being adjusted for any VDECS) is less than or equal to the fleet's NOx target in Table 2 for the vehicle engine's maximum power and the next compliance date, Index for the most recent compliance date.
1. **Small Fleets** – A small fleet meeting that met the BACT requirements in section 24162449(d)(2) instead of the fleet average requirements in section 24162449(d)(1) on the most recent compliance date may not add a vehicle to its fleet unless both the following conditions are met:
- a. T-the vehicle engine' is Tier 2 or higher, and
- c. The vehicles Diesel PM Emission Factor is less than or equal to the Diesel PM target in Table 3 for the vehicle engine's maximum power and the next compliance date. engine's PM Emission Factor (after being adjusted for any VDECS) is less than or equal to the fleet's Diesel PM Index for the most recent compliance date.
- ~~(D) **Rounding** – If the horsepower required to be turned over or retrofit under section 24162449(d)(2)(A) or (d)(2)(B) is less than half of the maximum power of the next engine in the fleet that is subject to the turnover or retrofit~~

~~requirements, the next engine is not required to be turned over or retrofitted. Once the required horsepower to be turned over or retrofitted equals or exceeds half of the maximum power of the next engine in the fleet that is subject to the turnover or retrofit requirements, the next engine must be turned over or retrofitted.~~

(3) **Idling** - As of ~~March~~ May 1, 2008, fleets must meet the following idling limits.

(A) **Idling Limit** - No vehicle or engines subject to this regulation may idle for more than 5 consecutive minutes. Idling of a vehicle that is owned by a rental company is the responsibility of the renter or lessee, and the rental agreement should so indicate. The idling limit does not apply to:

1. idling when queuing,
2. idling to verify that the vehicle is in safe operating condition,
3. idling for testing, servicing, repairing or diagnostic purposes,
4. idling necessary to accomplish work for which the vehicle was designed (such as operating a crane),
5. idling required to bring the machine system to operating temperature, and
6. idling necessary to ensure safe operation of the vehicle.

(B) **Written Idling Policy** - As of ~~March~~ May 1, 2008, medium and large fleets must also have a written idling policy that is made available to operators of the vehicles and informs them that idling is limited to 5 consecutive minutes or less.

(C) **Waiver** - A vehicle owner may apply to the Executive Officer for a waiver to allow additional idling in excess of 5 consecutive minutes. The Executive Officer shall grant such a request upon finding that the vehicle owner has provided sufficient justification that such idling is necessary.

(4) **Changing Fleet Size** –

(A) Small fleets that become medium fleets must meet the medium fleet requirements on the reporting date two years subsequent.

(B) Large fleets that become medium fleets must meet the medium fleet requirements on the next reporting date.

(C) Medium fleets that become small fleets must meet the small fleet requirements on the next reporting date.

(5) **New Fleets** – New fleets must meet the fleet average requirements in section ~~24162449~~(d)(1) within three months of purchasing vehicles subject to the regulation or bringing such vehicles into the State of California for the first time after March 1, 2008. New fleets do not have the option of complying with the BACT requirements in section ~~24162449~~(d)(2). New fleets must comply with the idling requirements in section ~~24162449~~(d)(3) immediately upon purchasing vehicles subject to the regulation or upon bringing such vehicles into the State. New fleets must report vehicles subject to the regulation to ARB within 30 days of purchasing or bringing such vehicles into the State, in accordance with the requirements in section ~~24162449~~(g).

(6) **Fleet Ownership Transferred** – If ownership of an entire fleet that was meeting the BACT requirements in lieu of the fleet average requirements is transferred to a new fleet owner who did not own a fleet before the transfer of ownership, the fleet may continue to meet the BACT requirements. That is, transfer of ownership to a new owner who did not own a fleet before does not automatically require the fleet to begin meeting the fleet average requirements in section 24162449(d)(1). If existing fleets acquire entire fleets, however, they must meet the requirements for adding vehicles in sections 24162449(d)(1)(C) and 24162449(d)(2)(C) when adding the entire fleet.

(2) **Adding Vehicles** – Between May 1, 2008 and the first fleet average compliance date in Table 1, 2, or 3 for the fleet, a fleet may not add a vehicle with a Tier 0 engine to its fleet.

(e) **Special Provisions/ Compliance Extensions**

(1) **VDECS Failure:** ~~For any fleet not meeting the fleet average and complying with the BACT requirements instead, In the event of a failure or damage of a VDECS, the following conditions apply:~~

(A) Failure or Damage During the Warranty Period. If a VDECS fails or is damaged within its warranty period and it can not be repaired, the owner must replace it with the same level VDECS or higher for the vehicle within 90 days of the failure.

(A) Failure or Damage Outside the Warranty Period.

1. Before Final Compliance Date - If a VDECS fails or is damaged outside of its warranty period before March 1, 2021 for large and medium fleets, or before March 1, 2026 for small fleets and it can not be repaired and the fleet would not meet the fleet average requirements in 2449(d)(1) for the most recent compliance date if the VDECS that failed were removed, then within 90 days of the failure, the owner must replace it with the highest level VDECS available for the engine at time of failure ~~or meet another available BACT option for the vehicle.~~

1. After Final Compliance Date - If a VDECS fails or is damaged outside of its warranty period on or after March 1, 2021 for large and medium fleets, or on or after March 1, 2026 for small fleets and it can not be repaired, then within 90 days of the failure, the owner must replace it with the highest level VDECS available for the engine at time of failure, regardless of whether the fleet met the fleet average requirements in 2449(d)(1) for the most recent compliance date.

(1) **Fuel-based Strategy VDECS:**

If a fleet owner determines that the highest level VDECS for a large percentage of his fleet would be a Level 2 fuel verified as a diesel emission control strategy, and implementation of this VDECS would require installation of a dedicated storage tank, then the fleet owner may request prior approval from the Executive Officer to allow use of the level 2 fuel-based strategy across its fleet. If an owner



~~elects to use Level 2 fuel-based diesel emission control strategy across its fleet, and some vehicles can use a Level 3 hardware diesel emission control strategy, then the owner must request prior approval from the Executive Officer to use the Level 2 fuel-based diesel emission control strategy across his whole fleet under the BACT requirements.~~

(A)

Extension for Discontinuation of Fuel Verified as a Diesel Emission Control Strategy. If a fleet owner who has relied upon a fuel verified as a diesel emission control strategy to meet the fleet average requirements in 2449(d)(1) discontinues use of the fuel due to circumstances beyond the fleet owner's control, the owner may apply to the Executive Officer no later than 30 days after discontinuation for up to two years additional time to come back into compliance with the fleet average requirements in 2449(d)(1). The Executive Officer then has 30 days to act upon the request. Fleets that did not meet the fleet average requirements in 2449(d)(1) in the most recent compliance year may not apply for this extension.

(3)(1) Exemption for Vehicles Used for Emergency Operations: Vehicles used solely for emergency operations are exempt from the performance requirements in section ~~2416~~2449(d) but still must be labeled and reported in accordance with sections ~~2416~~2449(f) and (g). Vehicles used solely for emergency operations need not be included in the sum of maximum power when determining fleet size. Owners of vehicles brought into California for emergency operations that last longer than three months must report such entry to ARB and request an equipment identification number within three months of entering the state. Vehicles used solely for emergency operations and that stay in California for less than three months do not have to be labeled. For vehicles used both for emergency operations and for other purposes, hours of operation accrued when the vehicle is used for emergency operations do not need to be included when determining whether the vehicle meets the low-use vehicle definition.

(1) Exemption for Dedicated Snow Removal Vehicles: Dedicated snow removal vehicles are exempt from the performance requirements in section 2449(d) but still must be labeled and reported in accordance with sections 2449(f) and (g). Dedicated snow removal vehicles need not be included in the sum of maximum power when determining fleet size.

(5)(2) Use of Experimental Diesel ~~PM~~ Emission Control Strategies: ~~If a fleet owner wishes to use an experimental, or non-verified, diesel emission control strategy, the~~ An owner must first obtain approval from the Executive Officer for a compliance extension. To obtain approval, the owner must demonstrate either that (A) for the use of an experimental, or non-verified, diesel PM control strategy if a VDECS is not available or if the owner can demonstrate that an existing VDECS is not feasible or not safe for their vehicle or application.

or (B) that use of the non-verified strategy is needed to generate data to support verification of the strategy—. The owner or operator shall keep documentation of this use in records as specified. The application must include emissions data and detailed control technology description demonstrating the experimental control achieves at least a Level 2 diesel PM emission reduction. If the application demonstrates that the device achieves at least 50 ~~percent~~ percent reductions in diesel PM, it may be treated like a Level 2 VDECS. If the application demonstrates that the device achieves at least 85% percent reductions in PM, it may be treated like a Level 3 VDECS. If the application demonstrates that the device achieves a NOx reduction over 15%, the NOx reduction may be counted.

Each vehicle engine retrofit with the experimental strategy will be considered to be in compliance for the duration of the experiment, until it expires. The owner must bring the fleet into compliance prior to the expiration of the experimental diesel ~~PM~~ emission control strategy extension.

**(6)(3) Compliance Extension for Equipment Manufacturer Delays.** An owner

or operator who has purchased new equipment (including VDECS) or vehicles in order to comply with this regulation, will be excused from immediate compliance if the new equipment or vehicles have not been received due to manufacturing delays as long as the following conditions are met:

- (A) The equipment or vehicle was purchased, or the owner and seller had entered into contractual agreement for the purchase, at least six months prior to the required compliance date; and
- (B) Proof of purchase, such as a purchase order or signed contract for the sale, including engine specifications for each applicable piece of equipment, must be maintained by the owner and provided to an agent or employee of ARB upon request.
- (C) The new equipment or vehicles are immediately placed into operation upon receipt.

- (1) **Compliance ExtensionExemption for Low-Use Vehicles - Until March 1, 2020 for medium and large fleets and March 1, 2025 for small fleets.** ~~Low-use vehicles are not subject to the compliance requirements (i.e., are not counted in the fleet average and are exempt from the BACT requirements). exempt from the performance requirements in section 2449(d) but still must be labeled and reported in accordance with sections 2449(f) and (g).~~ Low-use vehicles also need not be included in the sum of maximum power when determining fleet size.

Vehicles that formerly met the low-use vehicle definition, but whose use increases to 100 hours per year or greater must meet the BACT requirements or be included in the fleet average calculation by the next compliance date. For example, a formerly low-use engine that exceeds 100 hours per year between

March 1, 2013 and February 28, 2014 must be included in the fleet average reported in 2014.

**(4) VDECS That Impairs Safe Operation of Vehicle -**

- (1) ~~Vehicles that formerly met the low-use vehicle definition, but whose use increases to 100 hours per year or greater must meet the BACT requirements or be included in the fleet average calculation by the next compliance date. For example, a formerly low-use engine that exceeds 100 hours per year between March 1, 2013 and February 28, 2014 must be included in the fleet average reported in 2014.~~ A fleet owner may request that the Executive Officer find that a VDECS should not be considered the highest level VDECS available because it cannot be safely installed or operated in a particular vehicle application. The requesting party shall provide documentation to support its claims that the VDECS cannot be safely installed or operated. Documentation may include reports and findings of federal, state or local government agencies, independent testing laboratories, engine or equipment manufacturer studies, or other equally reliable source. The Executive Officer shall review the documentation submitted and any other reliable information that he or she wishes to consider and shall make his or her determination based upon the totality of the evidence. The Executive Officer shall send a written determination letter to the requesting party within 60 days of the request being submitted.

**Compliance Flexibility for Delay of Tier 4 Interim or Final Vehicles** – If the Executive Officer finds that there is a delay in availability of vehicles with engines meeting the Tier 4 interim or final emission standards so that vehicles with Tier 4 interim or final engines to meet a fleet's needs are not available or not available in sufficient numbers or in a sufficient range of makes, models, and sizes, then the Executive Officer may grant an extension to the fleet from the requirements in 2449(d)(1) and 2449(d)(2). If such a delay affects a group of fleets, the Executive Officer may issue an extension to all fleets with certain characteristics. Any such delay must be documented based on verifiable information from the fleet regarding its vehicle needs and/or verifiable information from the equipment manufacturer, engine manufacturer, distributor, and/or dealer regarding the unavailability of appropriate vehicles with Tier 4 interim or final engines. –

- ~~(9)(5) For medium and large fleets, the exemption for low-use vehicles ends in 2020. For small fleets, the exemption for low-use vehicles ends in 2025. As of the reporting dates in 2020 for medium and large fleets and 2025 for small fleets, each fleet owner must either demonstrate that his fleet, including low-use vehicles, meets the fleet average requirement in Section 24162449(d)(1), or install the highest level VDECS on all low-use vehicles.~~

- (f) **Labeling** – All vehicles with engines subject to the regulation must be labeled with an ARB-issued equipment identification number (EIN). ARB will issue unique EIN to the fleet owner for each vehicle subject to the regulation in response to the initial reporting described in Section 24162449(g)(1) and the annual reporting described in

Section 24162449 (g)(2). All owners of vehicles subject to the regulation must comply with the following labeling requirements.

- (1) Application for EIN for added vehicle – Notwithstanding the requirements for vehicles used for emergency operations in section 24162449(e)(3), if a fleet owner adds a vehicle to his California fleet or brings a vehicle into California from outside the state, the owner has 30 days from the date of purchase or the date the vehicle enters California to apply to ARB for an EIN or, if the vehicle already has an EIN, to inform ARB of the purchase. If the reporting date under Section 24162449(g)(2) occurs before 30 days after purchase, the annual reporting may serve as the application for an EIN.

Applications for an equipment identification number should be submitted electronically per the guidelines approved by the Executive Officer for electronic data reporting, or mailed or delivered to ARB at the address listed immediately below:

California Air Resources Board  
Mobile Source Control Division (In-Use Off-road Diesel)  
P.O. Box 2815  
Sacramento, CA 95812.

- (2) Affixing Equipment Identification Number – Within 30 days of receipt of the ARB-issued EIN, owners shall permanently affix or paint the EIN(s) on the vehicle in clear view according to the following specification:
  - (A) The EIN shall be white on a red background.
  - (B) The EIN shall be located in clear view on the left (port) side of the outside of the vehicle approximately 5 feet above the ground, or, if the vehicle is not 5 feet tall, on the highest point of the vehicle.
  - (C) Each character shall be at least 3 inches (7.6 centimeters) in height and 1.5 inches (3.8 centimeters) in width.
  - (D) The EIN shall be maintained in a manner that retains its legibility for the entire life of the vehicle.

- (g) **Reporting** – Reporting is required for each and every fleet. Large and medium fleets may report separately for different divisions or subsidiaries of a given company or agency. Fleet owners must submit reporting information using forms approved by the Executive Officer.

- (1) Initial reporting – All fleet owners must submit the information in section 24162449(g)(1)(A) through (C) to ARB by their initial reporting date. In the initial reporting, fleet owners must report information regarding each vehicle subject to this regulation in their fleet as of March 1, 2008. The initial reporting date for large fleets is April-May 1, 2008. The initial reporting date for medium fleets is June 1, 2008. The initial reporting date for small fleets is August 1, 2008.

Reports should include the following:

- (A) **Owner Contact Information** – Responsible person name, corporate parent (if applicable), company or agency name, street address, phone number, email address (if available), and taxpayer identification number.
- (B) **Vehicle List** – A list of each vehicle subject to this regulation along with the following information for each vehicle:
  1. Vehicle manufacturer;
  2. Vehicle model;
  3. Vehicle model year;
  4. Whether the vehicle is a low-use vehicle;
  5. Whether the vehicle is a specialty vehicle;
  6. Whether the vehicle is one that the owner intends to retire within one year; and
  7. For each engine that propels the vehicle, the engine manufacturer, engine family, engine serial number, engine model year, engine maximum horsepower, type of retrofit emission control equipment installed (if any), date installed, and its verification level.
- (C) **Low-Use Vehicles** – For vehicles that owners intend to define as low-use, report two hour meter readings, one from on or before March 1, 2007 and one from on or after March 1, 2008, and the dates of reading.
- (D) **Specialty Vehicles** – For vehicles that owners intend to define as specialty vehicles, report demonstration that no repower is available, per criteria approved by the Executive Officer and no used vehicle with a cleaner engine is available to serve a function equivalent to and perform work equivalent to that of the specialty vehicle.

(2) **Annual Reporting and Compliance Certification** – All fleet owners must review and update the information submitted under section [24162449\(g\)\(1\)](#) annually, and submit the information in section [24162449\(g\)\(2\)\(A\)](#) through (C) to ARB by the reporting date of each subsequent reporting year. The large fleet reporting date is April 1, the medium fleet reporting date is June 1, and the small fleet reporting date is August 1. Large fleets must report annually each year from 2009 to 2020. Medium fleets must report annually each year 2010 to 2020. Small fleets must report annually each year from 2012 to 2025. Any fleet that fails to meet the fleet average target rate for the final compliance date in section [24162449\(d\)\(1\)](#) must continue to report annually each year until it does so. Fleets must use forms approved by the Executive Officer for submittal of the required reporting information.

- (A) **Compliance Certification** – A certification signed by a responsible official or a designee thereof that the information reported is accurate and that the fleet is in compliance with the regulation. The certification must be submitted on a form approved by the Executive Officer. If a designee signs the compliance certification, a written statement signed by the responsible official designating the designee must be attached to the compliance certification and submitted to ARB. If the fleet is a Captive Attainment Area Fleet, the certification must



certify that the fleet's vehicles did not operate outside the counties listed in 2449(c)(5).

(B) **Changes Since Last Reporting** – Any additions, deletions, or changes to the fleet must be reported. Such changes may include vehicles removed from the fleet, vehicles added to the fleet through purchase or by bringing into California, vehicles newly defined as low use or specialty vehicles, repowers, and retrofits. If there are no changes, the fleet may indicate there are no changes.

(A) **Low-Use Vehicles** –

1. Vehicles Used Only In California - For vehicles defined as low-use that operate only in California, report the hour meter readings for the last 12 months and the dates of reading. Fleets must report two hour meter readings, one from before or on March 1 of the previous year and one from on or after March 1 of the current year.

1. Vehicles Used In and Outside California - For vehicles defined as low-use that operate in and outside California, submit a log that contains the following information:

a. Each date the vehicle entered California and the hour meter reading upon entry.

~~b.a.~~ Each date the vehicle exited California and the hour meter reading upon exit.

(3) **New Fleet Reporting** – New fleets must submit the information in section 24162449(g)(1)(A) through (C) to ARB for vehicles subject to the regulation to ARB within 30 days of purchase or bringing such vehicles into the State. Beginning the first March 1 that is more than 30 days after the date of purchase or bringing a vehicle into the State, new fleets must comply with the annual reporting requirements in section 24162449(g)(2).

(h) **Record keeping** – Fleet owners must maintain copies of the information reported under section 24162449(g), as well as the records described in section 24162449(h)(1) to (6) below, and provide them to an agent or employee of the ARB within five business days upon request. Records must be kept at a location within the State of California.

(1) **Changes Since Last Reporting Period** - Any additions, deletions, or changes to the fleet since the last reporting.

(2) **Vehicles Not Yet Labeled** – For newly purchased or acquired vehicles or vehicles recently brought into the state that have not yet been labeled per section 24162449(f)(2), records must be kept of the vehicle purchase date or the date the vehicle entered the state.

(3) **VDECS Failure** – Records of any VDECS failure and replacement.

(4) **Fuel-based Strategy** – Records of any approval from ARB Executive Officer to use a fuel strategy as in Section 24162449(e)(2).

(5) **Experimental Diesel PM Control Strategy** – For fleets using an experimental diesel PM control strategy, approval from the Executive Officer for use of the



experimental diesel PM control strategy, the test plan and test data used in the experimental diesel PM control strategy application, etc.

(6) **Manufacturer Delay** – For any vehicles or VDECS for which the fleet owner is utilizing the equipment manufacturer delay provision in section ~~24162449~~(e), proof of purchase, such as a purchase order or signed contract for the sale, including engine specifications for each applicable piece of equipment or vehicle.

(7) **Record Retention** – Each owner shall maintain the records for each vehicle subject to the regulation until it is retired and for the overall fleet as long as the owner has a fleet. If vehicle ownership is transferred, the seller shall convey the vehicle records to the buyer. If fleet ownership is transferred, the seller shall convey the fleet records to the buyer. Dealers must maintain records of the disclosure of regulation applicability required by Section ~~24162449~~(j) for three years after the sale.

(i) **Right of Entry** – For the purpose of inspecting off-road vehicles and their records to determine compliance with these regulations, an agent or employee of ARB, upon presentation of proper credentials, has the right to enter any facility (with any necessary safety clearances) where off-road vehicles are located or off-road vehicle records are kept.

(j) **Disclosure of Regulation Applicability** – Any person selling a vehicle with an engine subject to this regulation in California must provide the following disclosure in writing to the buyer on the bill of sale, “When operated in California, ~~this any off-road diesel~~ vehicle may be subject to the California Air Resources Board In-Use Off-road Diesel Vehicle Regulation. It therefore could be subject to retrofit or accelerated turnover requirements to reduce emissions of air pollutants. For more information, please visit the California Air Resources Board website at <http://www.arb.ca.gov/msprog/ordiesel/ordiesel.htm>.”

## Appendix A –

Use the values in these tables unless engine is a flexibility engine certified January 1, 2007 or later to the implementation flexibility standards 13 CCR 2423(d), or unless the engine is an engine certified to on-road standards. Engines certified to on-road standards should use the standard to which the engine is certified. Flexibility engines certified January 1, 2007 or later should use the emission standard to which the engine is certified. Engines certified to Family Emission Limits should still use the emission factors in the table below.

For engines that have been retrofit with VDECS, the PM Emission Factor is reduced 50% percent for a Level 2 VDECS, and 85% percent for a Level 3 VDECS; the NOx Emission Factor is reduced by whatever percentage NOx emission reductions are verified. The PM Emission Factor is not reduced for a Level 1 VDECS.

PM Emissions Factors by Horsepower and Year (g/bhp-hr)								
Engine Model Year	Horsepower Group							
	25-49	50-74	75-99	100-174	175-299	300-599	600-750	Over 750
1900-1969	0.950	1.200	1.200	1.100	1.100	0.950	0.950	0.950
1970-1971	0.950	1.200	1.200	0.940	0.940	0.810	0.810	0.810
1972-1987	0.950	1.200	1.200	0.780	0.780	0.680	0.680	0.680
1988	0.950	0.980	0.980	0.540	0.540	0.490	0.490	0.490
1989-1995	0.950	0.980	0.980	0.540	0.540	0.490	0.490	0.490
1996	0.950	0.980	0.980	0.540	0.40	0.40	0.40	0.500
1997	0.950	0.980	0.980	0.600	0.40	0.40	0.40	0.500
1998	0.950	1.090	1.090	0.600	0.40	0.40	0.40	0.500
1999	0.60	1.090	1.090	0.600	0.40	0.40	0.40	0.500
2000	0.60	1.090	1.090	0.600	0.40	0.40	0.40	0.40
2001	0.60	1.090	1.090	0.600	0.40	0.15	0.40	0.40
2002	0.60	1.090	1.090	0.600	0.40	0.15	0.15	0.40
2003	0.60	1.090	1.090	0.22	0.15	0.15	0.15	0.40
2004	0.45	0.30	0.30	0.22	0.15	0.15	0.15	0.40
2005	0.45	0.30	0.30	0.22	0.15	0.15	0.15	0.40
2006	0.45	0.30	0.30	0.22	0.15	0.15	0.15	0.15
2007	0.45	0.30	0.30	0.22	0.15	0.15	0.15	0.15
2008	0.22	0.22	0.30	0.22	0.15	0.15	0.15	0.15
2009	0.22	0.22	0.30	0.22	0.15	0.15	0.15	0.15
2010	0.22	0.22	0.30	0.22	0.15	0.15	0.15	0.15
2011	0.22	0.22	0.30	0.22	0.015	0.015	0.015	0.07
2012	0.22	0.22	0.015	0.015	0.015	0.015	0.015	0.07
2013	0.02	0.02	0.015	0.015	0.015	0.015	0.015	0.07
2014	0.02	0.02	0.015	0.015	0.015	0.015	0.015	0.07
2015 and later	0.02	0.02	0.015	0.015	0.015	0.015	0.015	0.03

## NOx Emissions Factors by Horsepower and Year (g/bhp-hr)

Engine Model Year	Horsepower Group							
	25-49	50-74	75-99	100-174	175-299	300-599	600-750	Over 750
1900 – 1969	7.2	14.8	14.8	15.9	15.9	15.2	15.2	15.2
1970 – 1971	7.2	14.8	14.8	14.8	14.8	14.1	14.1	14.1
1972 – 1979	7.2	14.8	14.8	13.6	13.6	13.0	13.0	13.0
1980 – 1987	7.2	14.8	14.8	12.5	12.5	11.9	11.9	11.9
1988	7.1	9.9	9.9	9.3	9.3	8.9	8.9	8.9
1989 – 1995	7.1	9.9	9.9	9.3	9.3	8.9	8.9	8.9
1996	7.1	9.9	9.9	9.3	6.9	6.9	6.9	8.9
1997	7.1	9.9	9.9	6.9	6.9	6.9	6.9	8.9
1998	7.1	6.9	6.9	6.9	6.9	6.9	6.9	8.9
1999	6.2	6.9	6.9	6.9	6.9	6.9	6.9	8.9
2000	6.2	6.9	6.9	6.9	6.9	6.9	6.9	6.9
2001	6.2	6.9	6.9	6.9	6.9	4.2	6.9	6.9
2002	6.2	6.9	6.9	6.9	6.9	4.2	4.2	6.9
2003	6.2	6.9	6.9	4.3	4.3	4.2	4.2	6.9
2004	4.9	4.9	4.9	4.3	4.3	4.2	4.2	6.9
2005	4.9	4.9	4.9	4.3	4.3	4.2	4.2	6.9
2006	4.9	4.9	4.9	4.3	2.6	2.6	2.6	4.2
2007	4.9	4.9	4.9	2.6	2.6	2.6	2.6	4.2
2008	4.9	3.0	3.0	2.6	2.6	2.6	2.6	4.2
2009	4.9	3.0	3.0	2.6	2.6	2.6	2.6	4.2
2010	4.9	3.0	3.0	2.6	2.6	2.6	2.6	4.2
2011	4.9	3.0	3.0	2.6	1.5	1.5	1.5	2.6
2012	4.9	3.0	2.5	2.5	1.5	1.5	1.5	2.6
2013	3.0	3.0	2.5	2.5	1.5	1.5	1.5	2.6
2014	3.0	3.0	2.5	2.5	0.3	0.3	0.3	2.6

### **NOx Emissions Factors by Horsepower and Year (g/bhp-hr)**

Engine Model Year	Horsepower Group							
	25-49	50-74	75-99	100-174	175-299	300-599	600-750	Over 750
2015 and later	3.0	3.0	0.3	0.3	0.3	0.3	0.3	2.6